

First Mediterranean record of Nigerian tonguesole *Cynoglossus browni* (Osteichthyes: Cynoglossidae) from the northern Tunisia coast.

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ملخص

أول إشارة لظهور سمكة *Cynoglossus browni* Chabanaud, 1949 بالمياه الشمالية للبلاد التونسية: تشير هذه الدراسة لأول عثور على سمكة *Cynoglossus browni* Chabanaud, 1949 بالسوق البلدي لمدينة بنزرت (شمال تونس). تم اصطيادها على الساحل الشمالي للبلاد التونسية في مارس 2016 و حتى هذا التاريخ فهي من الأسماك المعروفة على الساحل الغربي الإفريقي لجنوب الصحراء. نعلن في هذا التقرير و للمرة الأولى عن تواجدها بالبحر الأبيض المتوسط وبالمياه التونسية.
كلمات مفاتيح: أول إشارة- المتوسط-البلاد التونسية-أسماك دخيلة-*Cynoglossus browni*

RESUME

Première signalisation de *Cynoglossus browni* Chabanaud, 1949 sur les côtes septentrionale de la Tunisie.
Une espèce *Cynoglossus browni* Chabanaud, 1949, signalée jusqu'à cette date, sur les côtes ouest africaines seulement, a été observée au mois de mars 2016 sur les étalages des poissonniers de la ville de Bizerte (nord de la Tunisie). Nous la signalons pour la première fois en Méditerranée et dans les eaux tunisiennes.
Mots clés: Signalisation, Mer Méditerranée, Tunisie, espèces introduite, *Cynoglossus browni*

ABSTRACT

A specimen of *Cynoglossus browni* Chabanaud, 1949, is found on the stalls of fishmongers in the city of Bizerte in March 2016 (North of Tunisia). Up to this date; such species is commonly found in eastern Atlantic Ocean off the West African coast. We document its occurrence for the first time in the Mediterranean Sea and in Tunisian waters.

Key words: Occurrence, Mediterranean Sea, Tunisia, exotic species, *Cynoglossus browni*

INTRODUCTION

Cynoglossidae, a family of Pleuronectiformes with both eyes on the left sides, groups 3 genera: *Cynoglossus*, *Symphurus* and *Paraplagusia*.

The genus *Cynoglossus* found in the Atlantic, Indian, and Pacific Oceans groups 143 species (Froese and Pauly, 2016). Most of them habit relatively shallow water nevertheless, some species are found in deeper water. *Cynoglossus sinusarabici* (Chabanaud, 1931) is an exotic species occurring among number of alien species which have been described as invasive by different authors in east Mediterranean Sea (Zenetos *et al*, 2005).

We document hereafter the first occurrence of a second exotic species in the Mediterranean Sea

precisely in the north Tunisian waters *Cynoglossus browni* Chabanaud, 1949.

METHODS

On mars 2016, *Cynoglossus browni* Chabanaud, 1949, commonly known as the Nigerian tonguesole *Cynoglossus browni* (Fig. 1) was caught off Bizerte, North of Tunisia (Fig. 2). We have only an approximate position of the fishing area as described by the seller (market city of Bizerte). The fish was captured by a local fishing boat, with monofilament traps set at 15-20 m depth on a sandy bottom at about 2 Nm north-east of Bizerte. The specimen was photographed, measured and identified following Whitehead *et al*, (1986). Morphometric measurements and meristic counts were carried out.

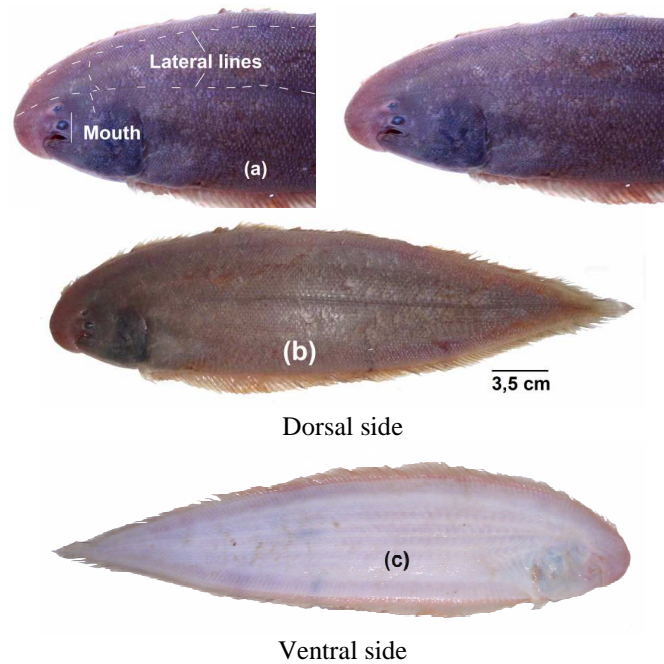


Fig. 1: *Cynoglossus browni* Chabanaud, 1949, 370 mm total length (TL) caught off the coast of Bizerte with detail of the head showing lateral lines (a).

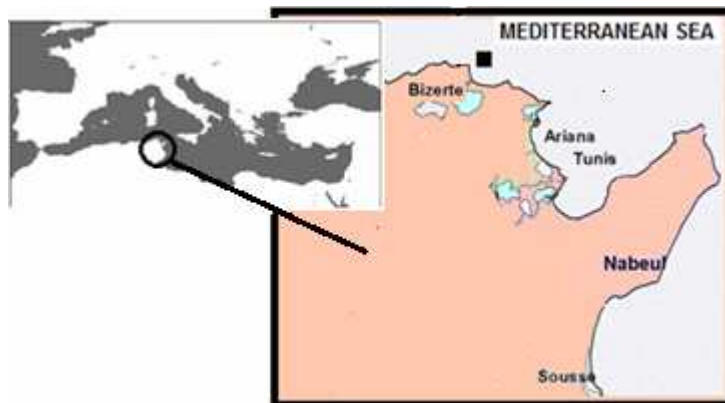


Fig. 2: Approximate location of the capture of *Cynoglossus browni* Chabanaud, 1949

RESULTS AND DISCUSSION

Table I: Main features of Cynoglossidae species.

Species	Hooked mouth		Mouth position		Eyed side, lateral lines				Blind side, LL		Elongated snout		Dorsal Fin rays	Anal Fin rays	Pelvic separated	
	yes	No	V	T	0	1	2	3	0	1	Yes	No			Yes	No
<i>C. browni</i> ¹	x		x				x		x			x	115-125	96-99		x
<i>C. cadenati</i> ²	x		x				x		x			x	109-115	87-88		x
<i>C. canariensis</i> ³	x		x					x				x			x	
<i>C. monodi</i> ³	x		x				x			x	x				x	
<i>C. sengalensis</i> ²	x		x				x			x		x			x	
<i>C. sinusarabici</i> ¹	x		x			x			x			x	99-101	78-79	x	
<i>S. ligulatus</i> ¹		x		x	x					x		x	>95	>85	x	
<i>S. nigrescens</i> ¹		x		x	x					x		x	83-94	71-78	x	
<i>S. normani</i> ²		x		x	x					x		x			x	
Target Species	x		x				x		x			x	119	92		x

V: Ventral; T: Terminal; 0: Absent; 1-Cynoglossidae of FNAM area (Quéro et al, in Whitehead *et al*, 1986)

2-Eastern Atlantic; 3- Eastern Central Atlantic

From Table I, prepared from data in Schneider (1992) and Quéro *et al.*, (1986), we can keep our species away from those of non-hooked and terminal mouth belonging to *Symphurus* genus. Among the 6 *Cynoglossus* species, *C. canariensis* is characterized by an elongated snout and the presence of 3 lateral lines on the ocular side, *C. monodi* and *C. senegalensis* have each one lateral line on the blind side and *C. sinusarabici* is provided by only a single lateral line on the ocular side. All of these species differ significantly from our specimen. The 2 remaining species, *C. browni* and *C. cadenati*, although they are characterized by the presence of 2 lateral lines on the ocular side, the absence of lateral line on the blind side and the presence of confluent pelvic fin with anal fin; they are however displaying different numbers of dorsal and anal fin rays. The numbers of rays found on the target specimen confirm the identification of *C. browni*.

Cynoglossus browni, known as the Nigerian tonguesole is a species of tonguefish commonly found in Eastern Atlantic Ocean off the coast of West Africa from coastal waters of Senegal, Gulf of Guinea and off the Congo coast (Menon, 1977; Quéro *et al.*, 1986; López-Abellán et de Cárdenas, 1990). It is a benthic species found on muddy and sandy bottom in depths of 15-40 m. The maximum abundance of the fish off the coast of Congo is reported on 15 m depth and it is rare up to 30 m (Fontana, 1981). Aghoghovwia *et al.*, 2015- sampled the species in Warri river (Niger delta), this is evidence that fish ~~back~~ inhabits? rivers. Feeding is chiefly based on various bottom Zoological groups belonging to sedentary epifauna and infauna (Loeuff *et al.*, 1993). The largest species grows up to about 420 mm SL (Desoutter, 1990); but the common size is about 300 mm (Sanches, 1991). To our knowledge this species has never been reported in Mediterranean Sea.

The Tunisian specimen was 37 cm TL and a weight of 270 g has the following features: body elongate and compressed; small eyes on left side with a broad space between them. The snout is rounded with a small inferior mouth. Dorsal and anal fins are confluent with caudal and pelvic fins. Pectoral fins are absent. The flatfish is characterized by two lateral lines on the eyed side, no lateral line in the blind side; the mouth, in contrast to other species, reaching far beyond the posterior edge of the fixed eye. The body is dark brown for eyed side and whitish for blind side. Morphometric measurements and meristic formula are given in table II.

Table II: Meristic and morphometric data of the specimen

Total weight in g.	270
Total length in mm	370
Standard length in mm	349.4

Head in mm	61.7
Head in % of total length	17.7%
Depth in mm	92.5
Depth in % of total length	25%
Eye in mm	5.1
Eye in % of head	8.2%
Eye in % of total length	1.4%
Snout in mm	19.5
Snout in % of head	31.6%
Snout in % of total length	5.3%
Number of dorsal rays	119
Number of anal rays	92
Number of caudal rays	14
Snout-dorsal fin in mm	20.6
Snout-ventral fin in mm	61.7
Snout anal fin in mm	75

Nigerian tonguesole is a common species in West African coast, it could have entered the Mediterranean Sea through the Gibraltar Canal, as many other teleosts recorded to date in the Tunisian water (Hattour, in preparation; Hattour et Ben Mustapha, 2015) such as *Solea senegalensis* (Torchio, 1973; Goucha et Ktari, 1981); *Chaunax suttkusi* (Ragonese et Giusto, 1997); *Pisodonophis semicinctus*; *Seriola fasciata* (Bradai, 2000); *Seriola carpenteri* (Pizzicori *et al.*, 2000); *Kyphosus sectatrix* (Hattour, 2006); *Pontinus kuhlii* (Bowdich, 1825) (Mercader et Garcia-Rubies, 2010); *Acanthurus monroviae* (Ben Souissi, *et al.*, 2011); *Plectorhinchus mediterraneus* (Hattour et Bradai, 2011) and *Seriola rivoliana* (Cuvier, 1833) (Mansour *et al.*, 2011). This hypothesis is hardly believable for the present case for the simple reason that Nigerian tonguesole has to travel for a large distance (8000 km) bringing it at least from the coast of Senegal to the Tunisian waters without being reported by any scientific paper on its migratory way. This hypothesis can be supported by the unique reporting of four specimens of the species in the North Sea (May, 1965) off the coast of the Netherlands, (9000 km) (Nijssen, 1965). An alternative option that may come to mind is that the occurrence of *Cynoglossus browni* could be the result of a direct human-mediated introduction, such as through ballast waters.

This hypothesis could be supported by the large trading activities between European Union and Sub-Saharan West African partners. Countries such as Ivory Coast, Ghana and Nigeria, where the species is common on their coasts, account for 80% of West Africa's exports to the EU (European commission, 2016). In addition, Tunisia following the growing of international maritime traffic has increased its trade, increasing thereby the risk of introduction in Tunisian waters of alien and invasive species (Hattour and Ben Mustapha, 2015). As an indication the port of Bizerte has insured in 2012, 30% of national trade according

to annual reports of the office of shipping and ports (OMMP, 2016).

BIBLIOGRAPHY

- Aghoghovwia, O.A., Oyelese, O.A., et Ohimain, E.I., 2015- Impacts of Industrialization on Fish Species Composition and Diversity in Warri River, Niger Delta, Nigeria. *Journal of Geography, Environment and Earth Science International* 3(3): 1-10.
- Ben Souissi, J., Diattaz, Y., Gargouri-Ben Abdallah, L., et Capapé, Ch., 2011- Occurrence of the Monrovia surgeonfish *Acanthurus monroviae* (Osteichthyes: Acanthuridae) off the coast of Tunisia (central Mediterranean). *Cah. Biol. Mar.* (2011) 52: 331-335.
- Bradai, M.N., 2000a- Diversité du peuplement ichtyque et contribution à la connaissance des sparidés. *Thèse de Doctorat d'Etat es-sciences naturelles, Université de Sfax, Faculté des Sciences de Sfax* : 600 pp.
- Desoutter, M., 1990. Cynoglossidae. p. 1050-1054. In J.C. Quero, J.C. Hureau, C. Karrer, A. Post and L. Saldanha (eds.) Check-list of the fishes of the eastern tropical Atlantic (CLOFETA). JNICT, Lisbon; SEI, Paris; and UNESCO, Paris. Vol. 2.
- European Commission 2016- *Directorate General for Trade, European Union, Trade with ACP-West Africa*, p.10.
- Fontana, A., (ed), 19881- Milieu marin et ressources halieutiques de la république populaire du Congo. *Travaux et document de l'ORSTM, N° 138*, p. 343.
- Froese, R., et Pauly, D., Editors. 2016- FishBase. Accessed through: World Register of Marine Species at <http://www.marinespecies.org> (on 2016-05-19).
- Goucha, M., et Ktari, M.H., 1981- Présence de *Solea senegalensis* (Kaup, 1858) sur les côtes du nord de la Tunisie. *Rapp. Comm. Int. Mer Médit.*, 27, 5 : 131-133.
- Hattour, A., 2006- Première observation de la calicagerie blanche *Kyphosus sectatrix* (Linnaeus, 1758) sur les cotes tunisiennes. *Bull. Inst. Natn. Scien. Tech. Mer de Salammbô*, Vol. 33, 123-125.
- Hattour, A., Bradai, M.N. 2011-First record of the Rubber-lip grunt *Plectorhinchus mediterraneus* (Guichenot 1850) (Osteichthyes: Haemulidae) in Tunisian waters (Central Méditerranéan) *Bull. Inst. Natn. Tech. Mer de Salammbô*, Vol 38, 159-163.
- Hattour, A., (In préparation)- Guide d'identification des ressources vivantes des eaux tunisiennes, Tome I : poissons autochtones et allochtones.
- Hattour, A., et Ben Mustapha, K., 2015- Le golfe de Gabès : Espèces des eaux de Ballast Patrimoniales et Introduites synthèse des campagnes 2009 et 2010 et Actualisation. *Publications de l'Institut National des Sciences et Technologie de la mer*, 360 p.
- Loeuff ; P., Marchal, E., et Amon-Kothias, J.B., 1993- Environnement et ressources aquatique de Côte d'Ivoire. Tme I : le milieu marin, Edition de l'ORSTOM, P. 329.
- López-Abellán, L.J., et de Cárdenas, E., 1990- Resultados de la campaña de prospeccion pesquera de los stocks de crustaceos en aguas de la Republica de Angola 'Angola 8903'. *Inf. Téc. Inst. Esp. Oceanogr.* No. 89. 140 p.
- Mansour, S., Azzouz, K., Boumaïza, M., Ben Amor, M.M., et Capapé, Ch., 2011- First record of rare species, the Almaco Jack, *Seriola rivoliana* (Osteichthyes : Carangidés) in Tunisian marine waters (central Mediterranean), *Cah. Biol. Mar.* 52: 187-192.
- Menon, A.G.K., 1977. A systematic monograph of the tongue soles of the genus *Cynoglossus* Hamilton-Buchanan Pisces: Cynoglossidae). *Smithson. Contrib. Zool.* (238):1-129.
- Mercader, L. and A. Garcia-Rubies, 2010. Premier signalement de *Pontinus kuhlii* (Scorpaenidae) en Tunisie (Méditerranée sud-occidentale). *Cybiurn* 34(2):227-228.
- Munroe, T.A. 1990. Eastern Atlantic Tonguefishes (*Symphurus*: Cynoglossidae: Pleuronectiformes), with descriptions of two new species. *Bulletin of Marine Science* 47 (2): 464-515.
- Mytilineou, C., Politou, C.Y., Papaconstantinou, C., Kavadas, S., D'Onghia, G., et Sion, L., 2005- Deep-water fish fauna in the eastern Ionian Sea. *Belg. J. Zool.* 135: 229-233.
- Nijssen, H., 1965- The occurrence of *Cynoglossus brwni* Chabanaud, 1949, in the North Sea, Beaufortia, Series of miscellaneous publications. Zoological Museum. Amsterdam. (155): 87-90.
- OMMP, 2016- [https:// fr.wikipedia__org/wiki /Office_de_la_marine_marchande_et_des_ports](https://fr.wikipedia.org/wiki/Office_de_la_marine_marchande_et_des_ports) (accessed on 25/05//2016).
- Pizzicori, P., Castriota, L., Marino, G., et Andaloro, F., 2000- *Seriola carpenteri*: a new immigrant in the Mediterranean from the Atlantic Ocean. *J. Fish Biol.* 57(5):1335-1338.
- Quéro, J.C., Desoutter, M., et Lagardère, F., 1986- Cynoglossidae. Pp. 1325–13628. In: *In: P.J.P. Whitehead, M.L. Bauchot, J.C. Hureau, J. Nielsen and E. Tortonese (eds), Fishes of the North-eastern Atlantic and the Mediterranean, vol III. UNESCO, Paris.*
- Ragonese, S., et Giusto, G.B., 1997- *Chaunax pictus* Lowe 1846. First record of the family

- Chaunacidae in the Mediterranean Sea. *J. Fish Biol.* Vol. 51, no. 5, pp. 1063-1065.
- Sanches, J.G., 1991. Catálogo dos principais peixes marinhos da República de Guiné-Bissau. Publ. Avuls. Inst. Nac. Invest. Pescas 16:429 p.
- Schneider, W., 1992- Fiches FAO d'identification des espèces pou les besoins de la pêche. Guide de terrain des ressources marines, commerciales du golfe de Guinée. Préparé et publié avec la collaboration du bureau régional de la FAO, 268p.
- Torchio, M., 1973- Soleidae. In *Check-list of the fishes of the North-Eastern and of the Mediterranean*, Hureau, J.C., and Monod, T., (eds). Paris,France: Unesco, pp 628-634.
- Whitehead, P.J.P, Bauchot, M.L., Hureau, J.C., Nielse, J., et Tortonèse, E., (ed) 1984-1986- *Fishes of the North-eastern Atlantic and the Mediterranean..* Vol. I, II et III. Unesco, Paris, pp 1016-1473.
- Zenetos, A., Çinar, M.E., Pancucci-Papadopoulou, M.A., Harmelin, J.G., Furnari, G., Andaloro, F., Bellou, N., Streftaris, N., et Zibrowius, H., 2005- Annotated list of marine alien species in the Mediterranean with records of the worst invasive species. *Mediterranean Marine Science* Volume 6/2, 2005, 63-118.